Introduction

Urban stormwater carries a number of pathogens, nutrients, heavy metals, sediment, and other contaminants as surface runoff flows over land. The increase in impervious or paved surfaces associated with development in urban areas reduces the natural infiltration of precipitation into the ground. With impervious cover, precipitation collects and carries contaminants before draining into nearby surface waters. Stormwater runoff from paved surfaces in developed areas can degrade downstream waters with both contaminants and increased volumes of water.

This publication aims to make information on innovative stormwater treatment technologies more available to New Hampshire's urban planners, developers, and communities. Traditional runoff management techniques such as detention basins and infiltration swales may be preferable, but are not always practical for treating urban stormwater. Lack of space for natural solutions is often a problem in existing developed areas, making innovative treatment technologies an attractive alternative. Mostly designed for subsurface installation, urban "retrofits" use less space than conventional methods to treat stormwater. This manual provides information on the innovative stormwater "retrofit" technologies currently available for use in developed areas in New Hampshire.

Purpose of Manual

The Innovative Stormwater Treatment Technologies Best Management Practices Manual has been developed in response to a New Hampshire Estuaries Project (NHEP) Water Quality Action Plan. The purpose of this manual is to provide innovative stormwater treatment technology information for developed areas within New Hampshire. In addition to providing detailed product information including function, installation, operation and maintenance, and relative cost, this manual also offers decision-making criteria to help in determining the most efficient Best Management Practice (BMP) system for specific site conditions.

The technologies in this manual are primarily for use in already-developed urban areas where traditional stormwater treatments cannot be used due to space constraints. Areas of new development and existing development that are not restricted by space should use traditional and low impact development (LID) practices. These LID techniques reduce the development impact left in the natural landscape, and reduce the future need for stormwater retrofits. For more information on low impact development, please refer to the Low Impact Development References in the appendix.

How to Use this Manual

This manual is divided into five chapters:

Chapter 1. Understanding Urban Stormwater

This chapter gives an overview of general stormwater information to answer the questions: What is stormwater? Why is it a problem? and, why is there a need for innovative stormwater treatment technologies? In addition, this chapter outlines the common pollutants in stormwater, examples of pollutant sources, and their related impacts.

Chapter 2. Selecting the Right Stormwater BMP Technology

This chapter describes considerations for choosing a BMP system. A list of decision criteria and questions aimed at obtaining answers to narrow the list of BMP technologies, and select the most appropriate BMP system for specific site conditions is provided.

Chapter 3. Cold Climate Considerations

This chapter lists and explains cold climate consideration that should be addressed prior to BMP selection and installation. In addition, this chapter discusses the potential for additional, more frequent maintenance requirements during late fall and winter months in New Hampshire due to seasonal occurrences such as leaf fall, and road salting and sanding.

Chapter 4. Installation, Operation and Maintenance Planning

This chapter emphasizes the importance of creating installation and operation & maintenance plans to increase the efficiency and longevity of BMPs. This section includes a template for site information, and an operation and maintenance schedule logbook page.

Chapter 5. Best Management Practices

This chapter gives details on several innovative stormwater BMPs and includes a technology summary matrix. The matrix is designed to allow the reader to easily view the characteristics of each BMP and refer to the assigned page in the manual for greater detail of those technologies that appear most appropriate for a specific project. For each new technology, this section provides information on the BMP general description, target contaminants, applications, installation and maintenance considerations, relative cost, performance, existing installations located in New Hampshire or New England, and installation and manufacturer contact information.